POTENTIAL FOR COOPERATIVE DISTRIBUTION OF PETROLEUM PRODUCTS IN THE SOUTH

FARMER COOPERATIVE SERVICE • U.S. DEPARTMENT OF AGRICULTURE

HIGHLIGHTS

Cooperatives' share of the petroleum market in the South badly lags the national average.

If the cooperative share in the South were the same as the national average—25 percent—farmers could realize an annual saving between $1 million and $4 million.

Cooperatives' market share in the South averages only 6.4 percent, ranging from less than 1 percent in Georgia and Florida to 20 percent in Virginia.

But the growth rate in the South for petroleum products bought by farmers from cooperatives increased 67 percent between 1964-65 and 1969-70, about triple the 20 percent increase in the United States.

The most important petroleum product in the South was gasoline, accounting for 46 percent of petroleum fuels distributed. LP gas came second with a 25-percent volume.

Cooperatives appraising new or expanded opportunities for bulk distribution of petroleum products should consider market potential, competition, and market entry alternatives.

Southern cooperatives thinking about distributing bulk petroleum products need about a 300,000-gallon market for a one-truck operation. Capital requirements range between $50,000 to $75,000, with driver pay accounting for about 68 percent of expenses. Net margin for each sales dollar ranges from 1 to 4 cents.

Cooperatives thinking about distributing LP gas need $150,000 to $200,000 in capital, reflecting the higher costs of pressurized storage, delivery, and farm-tank facilities for LP gas. For efficient use, a single truck needs to distribute 500,000 gallons of LP gas a year.

POTENTIAL FOR COOPERATIVE DISTRIBUTION OF PETROLEUM PRODUCTS IN THE SOUTH [+ fuel]

By John M. Bailey

ARVIN, 1913-

ONE OF EVERY EIGHT DOLLARS spent by farmers in the United States for production supplies and equipment is spent for petroleum products. In both 1964 and 1969, expenditures for petroleum were 12 percent of total farm outlays for operating supplies and equipment, excluding capital items. In 1968 farmers bought about 7.5 billion gallons of liquid fuels for production purposes (table 1). This volume, along with lubricating oil and grease, amounted to about $1.7 billion. Expenditures in 1971 totaled $1.8 billion.

Gasoline and diesel fuel for motor vehicles is the most important use of petroleum. Fuel oil, liquefied petroleum gas, and kerosene are used in production primarily for drying crops, controlling weeds, and heating poultry and livestock operations.

Table 1—Farm use of petroleum fuels in the U.S., 1968[1]

Farm use	Total	Gasoline	Diesel	LP gas	Other fuels
		Million gallons			
Production	7,492	4,186	1,505	1,351	450
Non-production	2,878	983	0	1,003	892
Total	10,370	5,169	1,505	2,354	1,342
		Percent			
Percent of total	100	50	15	22	13

[1] *Latest unpublished data. Econ. Res. Serv. U.S. Dept. Agr.*

The magnitude of farmer expenditures for petroleum used in production parallels the progress of mechanization in agriculture. Most rapid increase in expenditures was in the decade of the 1940's.

Table 2–Farm petroleum expenditures by decade in the U.S., 1939-1971[1]

Year	Petroleum expenditures for production	Increase over previous period
	Million dollars	*Percent*
1939	323	(Base)
1949	1,134	250
1959	1,467	30
1969	1,767	20
1971	1,833	4

[1] *Farm Income Situation-FIS 216. Econ. Res. Serv. U.S. Dept. Agr. July 1970.*

From a big increase of 250 percent from 1939 to 1949, the rate of gain was 30 percent in the next decade, 20 percent in the decade from 1959 to 1969, and a 4 percent increase for 1971 over 1969.

Petroleum products are also used on the farm for non-production purposes. These included gasoline and oil for the personal use of automobiles and trucks and fuel oil and LP gas for home heating, cooking, and water heating. In general, petroleum products used for non-production–household and personal use–amount to about a fourth of the total used by farmers. This amounted to about 2.9 billion gallons and $700 million in 1968. The expenditure for 1971 is estimated to be $740 million.

Farmers' total use of petroleum fuels thus was about 10.4 billion gallons in 1968, and their expenditures for such fuels amounted to about $2.4 billion. Estimated expenditure for 1971 is $2.5 billion.

FARM FUEL USE AND CO-OP DISTRIBUTION IN THE U.S.

For more than 40 years, farmers have used cooperatives to obtain liquid petroleum fuels. By 1942 cooperative volume was 700 million gallons, about one-seventh of total farm use. In 1968-69, volume distributed by cooperatives to farmers was almost 2.8 billion gallons, representing more than one-fourth of total farm use. Table 3 shows the relative importance of farmer cooperatives in the distribution of petroleum fuels by gallons for selected years.

From 1942 to 1957 the cooperative share of petroleum fuels distributed to farmers rose from 14 percent to 19 percent of total farm use, and by 1968-69 the proportion was near 27 percent. The quantity of petroleum fuels distributed to farmers by cooperatives has never accounted for more than 2.3 percent of total U.S. consumption since 1942. Cooperative volume in 1968-69 was 2 percent of U.S. use.

Farmers began distributing petroleum to obtain lower prices, consistent quality, and better service. The increase in volume, as a percent of total farm use, suggests that cooperatives have been reasonably successful in meeting their objectives. To assure farmers better prices, quality, and service, cooperatives have developed retail and wholesale distribution systems and obtain a considerable amount of products from their own refineries and oil wells. Thus, farmer-owned petroleum operations are now integrated from the oil well to the retail outlet and farm-delivery truck.

Table 3—Cooperatives' retail share of total U.S. and farm use of liquid fuels and LP gas, selected years, 1942-69

Year	Total U. S. use	Total farm use	Distribution by co-ops to farmers		
			Total	Percent of U.S. use	Percent of farm use
	Million gallons			*Percent*	
1942[1]	35,470	4,900	700	2.0	14.3
1947[1]	50,224	6,772	1,154	2.3	17.0
1950[1]	63,295	7,224	1,380	2.2	19.1
1953[1]	77,398	7,988	1,497	1.9	18.7
1957	[2]95,912	[3]8,404	[2]1,626	1.7	19.3
1959	[4]103,446	[5]8,610	[6]1,667	1.6	19.4
1969	[7]135,804	[8]10,370	[9]2,768	2.0	26.7

[1] *FCS Serv. Rept. 24, p. 2 (includes LP gas after 1953), Dec. 1959.*

[2] *Calculated from FCS Gen. Rept. 58, May 1959.*

[3] *Calculated on average yearly increase from 1953 to 1959.*

[4] *Petroleum Facts and Figures, 1961 ed.*

[5] *Liquid Petroleum Fuel Used By Farmers in 1959. Statis. Bull. No. 344, Statis. Reptg. Serv. U.S. Dept. Agr. May 1964.*

[6] *Estimate based on 2.5-percent increase in farmers' production expenditures for petroleum from 1957 to 1959.*

[7] *Mineral Industry Surveys, Bur. Mines, U.S. Dept. Interior, Dec. 1969.*

[8] *Unpublished estimates. Econ. Res. Serv. U.S. Dept. Agr.*

[9] *Regional cooperative reports, 1968-69.*

FARM FUEL USE AND CO-OP DISTRIBUTION IN THE SOUTH

Expenditures by farmers for petroleum products distributed by cooperatives in the South, as reported to FCS, reached about $12.8 million in the 1954-55 business year and nearly $27 million in 1964-65. By 1969-70 expenditures had increased to more than $46 million. The increase from 1954-55 to 1964-65 was 111 percent and from 1964-65 to 1969-70 was 71 percent.

Sales of petroleum products by cooperatives include those for both farm production and farm personal or family uses as well as some non-farm volume. The Economic Research Service figures include petroleum products used only in farm production that were estimated to be 72 percent of total farm use in 1968 (table 1). Thus, ERS expenditures in table 4 have been adjusted upward by one-third in both 1964 and 1969-70 to compare with cooperative distribution figures. On the other hand, the cooperative figures have been adjusted downward because, as estimated by regional cooperatives, 78 percent of cooperative sales were to farmers, and 22 percent were to non-farmers.

This procedure, however, tends to understate the volume of petroleum products farmers buy for production through cooperatives in the South. In other parts of the United States, heating fuels for non-farm homes account for a considerable part of the non-farm volume. Heating fuel for homes is less

Table 4—Total expenditures for petroleum products and amounts and proportion spent at cooperatives in the South, 1964 and 1969

State	Exp. for prod. [1]	Total exp. [2]	Total exp. at co-op. [3]	Farmer exp. at co-op. [4]	Percent of farmer exp. at co-op.	Exp. for prod. [5]	Total exp. [2]	Total exp. at co-op. [6]	Farmer exp. at co-op. [4]	Percent of farmer exp. at co-op.
	1964		1964-65	1964-65		1969		1969-70	1969-70	
	1,000 dollars				*Percent*	*1,000 dollars*				*Percent*
Alabama	18,859	25,139	806	629	2.5	27,840	37,111	661	516	1.4
Arkansas	32,445	43,249	6,315	4,926	11.4	50,318	67,074	9,900	7,722	11.5
Florida	18,374	24,493	27	21	–	30,508	40,667	212	165	0.4
Georgia	30,533	40,700	56	44	–	41.966	55,941	105	82	0.1
Kentucky	22,371	29,821	2,228	1,738	5.8	34,015	45,342	4,000	3,120	6.9
Louisiana	18,713	24,944	611	476	1.9	30,745	40,983	700	546	1.3
Mississippi	28,416	37,879	3,445	2,687	7.1	41,320	55,080	6,909	5,389	9.8
N. Carolina	44,427	59,221	1,387	1,082	1.8	71,062	94,726	5,100	3,978	4.2
S. Carolina	18,385	24,507	590	460	1.9	24,433	32,569	800	624	1.9
Tennessee	21,934	29,238	4,104	3,201	10.9	31,000	41,323	7,200	5,616	13.6
Virginia	19,666	26,215	7,409	5,779	22.0	25,693	34,249	10,418	[7]6,938	20.3
Total	274,123	365,406	26,978	21,043	5.8	408,900	545,065	46,005	34,696	6.4

[1] *FCS Serv. Rept. 77, Rev. 1966.*

[2] *Production expenditures increased by 33% to allow for non-production use and be comparable to farmer expenditures at cooperative.*

[3] *FCS Gen. Rept. 143, June 1967.*

[4] *Reduced by 22 percent to compensate for sales to non-farmers.*

[5] *1969 Census of Agriculture.*

[6] *FCS Res. Rept. 16, Dec. 1970 adjusted downward in some States to reflect sales to non-co-ops.*

[7] *Estimate 66.7% to farmers.*

important in the South and forms a lesser part of petroleum volume. Thus, farmers' production expenditures for petroleum at cooperatives in the South may account for a greater proportion of the total cooperative petroleum volume than in other areas.

Petroleum expenditures by farmers in 1969-70, adjusted to include both production and personal use, were highest for North Carolina with $95 million. Cooperatives distributed only 4.2 percent. Next highest in total adjusted expenditures was Arkansas with $67 million. About 11 percent of the amount was purchased through cooperatives. Virginia had the highest proportion of farmer purchases made at cooperatives. Virginia had the highest proportion of farmer purchases made at cooperatives with 20.3 percent. This, however, contrasts with more than 60 percent of the farm market for cooperatives in Minnesota, South Dakota, and Washington.

The States with the lowest percentages of petroleum products bought by farmers through cooperatives were Georgia and Florida with less than 1 percent. Farmer expenditures for petroleum and the percentage of those expenditures made at cooperatives in the South are shown in figure 1.

The proportion of petroleum products purchased by farmers at cooperatives in the South rose from 5.8 percent in 1964-65 to 6.4 percent in 1969-70, a 10 percent increase. The proportion purchased through cooperatives in North Carolina rose from 1.8 percent in 1964-65 to 4.2 percent in 1969-70, up about 133 percent. This increase in North Carolina's market share indicates the market potential in other southern States, where cooperatives have a low share of the petroleum market. However, cooperatives in North Carolina and other southern States would need to nearly quadruple their present share of the petroleum market to be near the national share of about 25 percent.

The cooperative share of the farm petroleum market in the United States for 1969-70, excluding the South, was 30 percent. In the South the cooperative share was 6.4 percent.

Another indication of the lag in southern cooperative petroleum volume shows in the South's share of total U.S. farmer expenditures. Farmers in the South had adjusted petroleum expenditures of $545 million in 1969, or 20.3 percent of the adjusted U.S. total of nearly $2.7 billion. For about the same period, 1969-70, southern cooperatives had petroleum sales to farmers of $35 million, or only 5.1 percent of U.S. cooperative petroleum volume to farmers of $675 million.

Petroleum expenditures by all farmers in 1970 in the United States increased from nearly $1.7 billion in 1964 to more than $2 billion in 1970, an increase of 21 percent.[2] For the area under study, the increase for adjusted petroleum expenditures by farmers was 29 percent, from more than $365 million in 1964 to more than $545 million in 1970. These figures indicate that petroleum expenditures for farm production in the South are increasing at a faster rate than the national rate. In the same period for those States, expenditures by farmers

[2]*Published figures adjusted upward 11.5 percent based on the 1964 census. Econ. Res. Serv. U.S. Dept. Agr.*

FIG. 1 TOTAL PETROLEUM EXPENDITURES OF FARMERS AND PERCENTAGE BOUGHT AT COOPERATIVES IN THE SOUTH, 1969

0% PERCENT OF FARMER EXPENDITURES FOR PETROLEUM AT CO-OPS

0 TOTAL FARMER EXPENDITURES FOR PETROLEUM

FIGURES IN MILLION OF DOLLARS

for petroleum at cooperatives increased about 67 percent, from about $21 million to $35 million.

Expenditures at cooperatives for petroleum products by farmers in the South increased 67 percent—about triple the 21-percent increase in the United States as a whole between 1964-65 and 1969-70. Thus, cooperative distribution in the South has grown at a rate that should make a 25-percent market share feasible. A 25-percent share of the total farm market in the South would be about $136 million—almost four times the 1969-70 adjusted cooperative volume of $35 million.

To be meaningful, a 25-percent farm market share for cooperatives in the South should be considered State by State. Table 5 shows calculated total farmer expenditures for petroleum in 1969-70 and expenditures by farmers at cooperatives in the South. Also shown is the cooperative volume for each State with a 25-percent market share and the gap between present volumes.

The largest percentage gap between current market share and a 25-percent share exists in Georgia. Its market share in 1969-70 was only one-tenth percent. In North Carolina, cooperatives would need $19.7 million above the State's present $4 million farm volume to have a 25-percent market share. The total petroleum market for farmers there is $94.7 million, almost $30 million higher than the next largest market in Arkansas.

Cooperatives in seven of the 11 States would need to add from $7.5 million to $10 million in petroleum sales to reach the 25-percent figure. A 25-percent market goal can be seen as a level that provides farmers of the South with petroleum services and benefits equal to what farmers in other aresas of the U.S. enjoy.

Table 5—Cooperatives' share of petroleum market and volume required for 25-percent market share in the South, 1969-70

State	Farmer expenditures[1] for petroleum		Co-ops' present share of market	Cooperative volume	
	Total	Cooperative		Market share of 25%	Increase over present volume
	1,000 dollars		*Percent*	*1,000 dollars*	
Alabama	37,111	516	1.4	9,278	8,762
Arkansas	67,074	7,722	11.5	16,768	9,046
Florida	40,667	165	0.4	10,167	10,002
Georgia	55,941	82	0.1	13,985	13,903
Kentucky	45,342	3,120	6.9	11,336	8,216
Louisiana	40,983	546	1.3	10,246	9,700
Mississippi	55,080	5,389	9.8	13,770	8,381
N. Carolina	94,726	3,978	4.2	23,682	19,704
S. Carolina	32,569	624	1.9	8,142	7,518
Tennessee	41,323	5,616	13.6	10,331	4,715
Virginia	34,249	6,938	20.3	8,562	1,624
Total	545,065	34,696	6.4	136,267	101,571

[1] *See preceding table for calculation.*

Petroleum For Production Uses

The 1969 Census provides county data on petroleum expenditures for production purposes. Table 6 shows petroleum expenditures in 1969 and 1964 in the United States by State, and for the 10 counties in each State with the highest petroleum expenditures in 1969.

Data for the 10 high counties in each State, are listed in appendix table 1. In each State the 10 high counties are somewhat geographically concentrated (See figure 1.).

The percentage of volume in the 10 high counties ranged from 20 percent in Georgia to 57 percent in South Carolina. Concentrated areas of petroleum use offer many advantages in distribution. However, they are likely to be areas with great competition among distributors because of the heavy volume potential.

Research and operation data indicate that $150,000 to $200,000 of bulk volume may be sufficient to cover expenses and yield a net savings. An analysis of county expenditures suggests the potential number of distributors that could profitably operate in a county or area.

For instance, Berrien County, Ga., had petroleum expenditures for farm production of $688,000 and perhaps a total farm petroleum expenditure (for all uses) of $915,000 in 1969. Thus, the potential was enough to enable four or five

Table 6—Total petroleum expenditures by farmers in the U.S., in the South (1964 and 1969), 10 counties with highest expenditures, and counties' proportion of each southern State's total expenditures, 1969[1]

State	Expenditures for petroleum		Expenditures for 10 high counties in each State—1969	Percent of State expenditures—1969
	1969	1964		
	1,000 dollars			*Percent*
United States	1,906,578[2]	1,786,789	–	–
South:				
Alabama	27,840	24,070	8,826	32
Arkansas	50,318	45,494	19,130	38
Florida	30,508	26,861	14,280	47
Georgia	41,966	38,285	8,205	20
Kentucky	34,015	27,954	7,339	22
Louisiana	30,745	24,678	12,450	40
Mississippi	41,320	36,105	16,345	40
N. Carolina	71,062	65,293	23,571	33
S. Carolina	24,433	23,135	13,964	57
Tennessee	31,000	27,245	9,035	29
Virginia	25,693	24,009	8,300	32
Total	408,900[3]	363,129		
Percent of U.S. total	24.1	20.3	–	–

[1] *1969 Census of Agriculture.*

[2] *Increase of 6.7 percent over 1964.*

[3] *Increase of 12.6 percent over 1964.*

full-time bulk distributors to profitably distribute petroleum products to farmers. If bulk distribution were part-time or the volume seasonal, a greater number of distributors could be involved. A part-time operation could be part of a general supply operation or it could use retail pumps to add to its volume.

In Colquitt County, Ga., farm production expenditures for petroleum were about $1.2 million in 1969 and total farm petroleum expenditures $1.6 million, a volume that would support perhaps eight or 10 full-time bulk operations and more part-time operations. However, in actual operations, established distributors' volume would likely increase rather than the number of distributors.

These data provide a basis for a more detailed review of the potential for developing bulk distribution services.

Number of Co-ops Handling Petroleum

In the United States in 1969-70, 36 percent of all cooperatives handled petroleum products, compared with 28 percent in the South. Table 7 shows number of cooperatives operating in the South, and the number and proportion of cooperatives in each State handling petroleum products.

In Tennessee and Arkansas 73 and 47 percent of the cooperatives, respectively, handled petroleum products. In contrast to these relatively high percentages, seven States had less than 17 percent of their cooperatives handling petroleum. In Florida only 5 percent reported handling petroleum products.

The handling of petroleum by a cooperative, however, may not be too significant, as far as liquid products are concerned, because selling a small volume of oil, grease, tires, batteries, and accessories might be the extent of involvement. As an indication of the small amount of petroleum distributed by

Table 7—Proportion of cooperatives in the U.S. and the South handling petroleum, 1969-70

State	Cooperatives operating in State	Cooperatives handling petroleum in State	Proportion of cooperatives handling petroleum
	Number		*Percent*
Alabama	67	14	21
Arkansas	106	50	47
Florida	96	5	5
Georgia	76	10	13
Kentucky	85	10	12
Louisiana	93	15	16
Mississippi	125	45	36
N. Carolina	38	4	11
S. Carolina	20	3	15
Tennessee	127	93	73
Virginia	120	18	15
Total in South	953	267	28
Total in other States	6,837	2,507	37
Total in U. S.	7,790	2,774	36

some cooperatives, consider 39 local associations in Mississippi that handled petroleum.

Petroleum sales of 28 of the locals averaged less than $20,000 and accounted for 13 percent of local sales. Another nine locals, with average sales of $170,000, had 36 percent, and the two locals with highest petroleum sales accounted for 51 percent of total cooperative volume reported by the 39 associations.

Thus, while 36 percent of the cooperatives in the States reported handling petroleum, only a few were seriously engaged in distributing petroleum products. The number of cooperatives that do not distribute petroleum products from bulk plants by tank truck indicates a better potential patronage base for expanding petroleum distribution.

Fuel Use by Product Type

Table 8 contains ERS estimates of the amounts of various fuels used by farmers in specified States in 1968. Farmers in the South used more than 2.1 billion gallons that year. These data provide an indication to farmers and their cooperatives of the relative importance of various fuels in petroleum distribution operations.

More gallons of gasoline were sold than any other fuel—about 965 million gallons, or 46 percent of the total. For Kentucky, Tennessee, and Virginia, gasoline accounted for more than half of total fuels used. LP gas ranked second with 538 million gallons. In Arkansas, LP gas volume was greater than gasoline. In Alabama, Georgia, Louisiana, and Mississippi, LP gas accounted for about a third of total fuel volume. In most States, LP gas was the second highest in use. Two exceptions were in North Carolina and Virginia, where fuel oil and kerosene for farm use, shown as other fuels, were greater. These fuels were used mostly to cure tobacco.

In both Mississippi and Arkansas, more than 70 percent of the farmers reported using LP gas (table 9). Georgia and Louisiana reported 61 and 60 percent, respectively. For all States considered, 44 percent of the farmers used LP gas. By number of farmers using LP gas, Mississippi had 70,000 and Arkansas 53,000 users. Georgia was third highest with 47,000, followed by North Carolina and Alabama with 46,000 farmers in each State using LP gas.

On the basis of ERS estimates of gallons of LP gas used in 1968, Georgia farmers averaged about 1,500 gallons per farm.

Local use of petroleum products may vary considerably from that shown for each State. For instance, broiler production is generally concentrated geographically, and producers are heavy users of LP gas for heating broiler houses. As another example, tobacco production is rather geographically centralized and uses large amounts of fuel, mostly fuel oil and LP gas, for curing. Use of LP gas for this purpose is increasing rapidly.

ECONOMICS OF COOPERATIVE DISTRIBUTION

A prime factor when considering petroleum distribution is economic feasibility. The term feasibility raises questions such as: What facilities are

Table 8–Estimated gallons of petroleum fuels for farm and non-farm use by kind of fuel in the South, 1968[1]

State	Total	Gasoline[2]	Diesel[2]	LP Gas[2]	Fuel Oil[3]	Kerosene[3]	Other[4]
				1,000 gallons			
Alabama	143,887	70,348	18,670	44,477	2,422	1,559	6,411
Arkansas	284,947	90,248	52,583	130,513	283	287	11,033
Florida	133,072	63,420	38,862	21,713	3,466	1,288	4,323
Georgia	213,469	96,488	36,915	65,349	3,879	2,268	8,570
Kentucky	177,576	101,218	9,406	37,777	19,925	4,760	4,490
Louisiana	160,850	62,404	30,972	57,885	1,716	64	7,809
Mississippi	212,951	90,193	32,590	84,444	911	619	4,194
N. Carolina	375,727	153,648	23,027	46,462	34,186	20,154	98,250
S. Carolina	132,555	65,232	15,110	19,909	7,873	7,625	16,806
Tennessee	148,806	95,841	14,752	23,167	4,687	3,557	6,802
Virginia	144,033	76,923	11,776	5,913	24,716	8,468	16,237
Total	2,127,873	965,963	284,663	537,609	104,064	50,649	184,925
Percent	100	46	13	25	5	2	9

[1] *Unpublished estimates. Econ. Res. Serv. U.S. Dept. Agr.*

[2] *For farm and non-farm use.*

[3] *Non-farm use only.*

[4] *Balancing figures.*

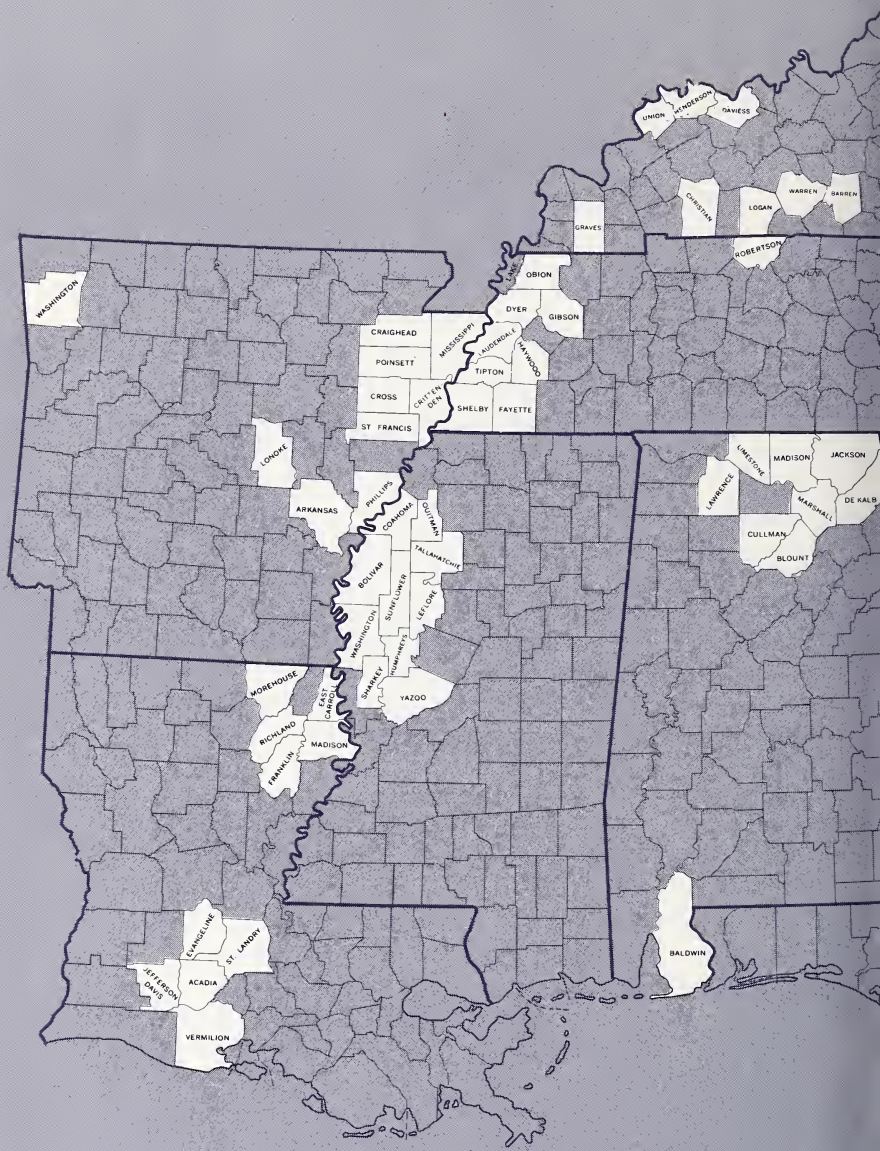

FIG. 2 TEN COUNTIES IN EACH ST
WITH HIGHEST PETROLEUM EXPEN
FOR FARM PRODUCTION, 1969


LOUDOUN
FAUQUIER
ROCKINGHAM
AUGUSTA
ACCOMACK
PITTSYLVANIA
HALIFAX
MECKLENBURG
BRUNSWICK
SOUTHAMPTON
GREENE
NASH
WAKE
WILSON
PITT
JOHNSTON
WAYNE
SAMPSON
DUPLIN
ROBESON
DARLINGTON
DILLON
COLUMBUS
HALL
LEE
FLORENCE
MARION
HORRY
SUMTER
CLARENDON
WILLIAMSBURG
ORANGEBURG
BULLOCH
DOOLY
WORTH
TIFT
COFFEE
BERRIEN
MITCHELL
COLQUITT
GRADY
GADSDEN
SUWANNEE
MARION
LAKE
ORANGE
HILLSBOROUGH
POLK
HENDRY
PALM BEACH
DADE

TE
TURES

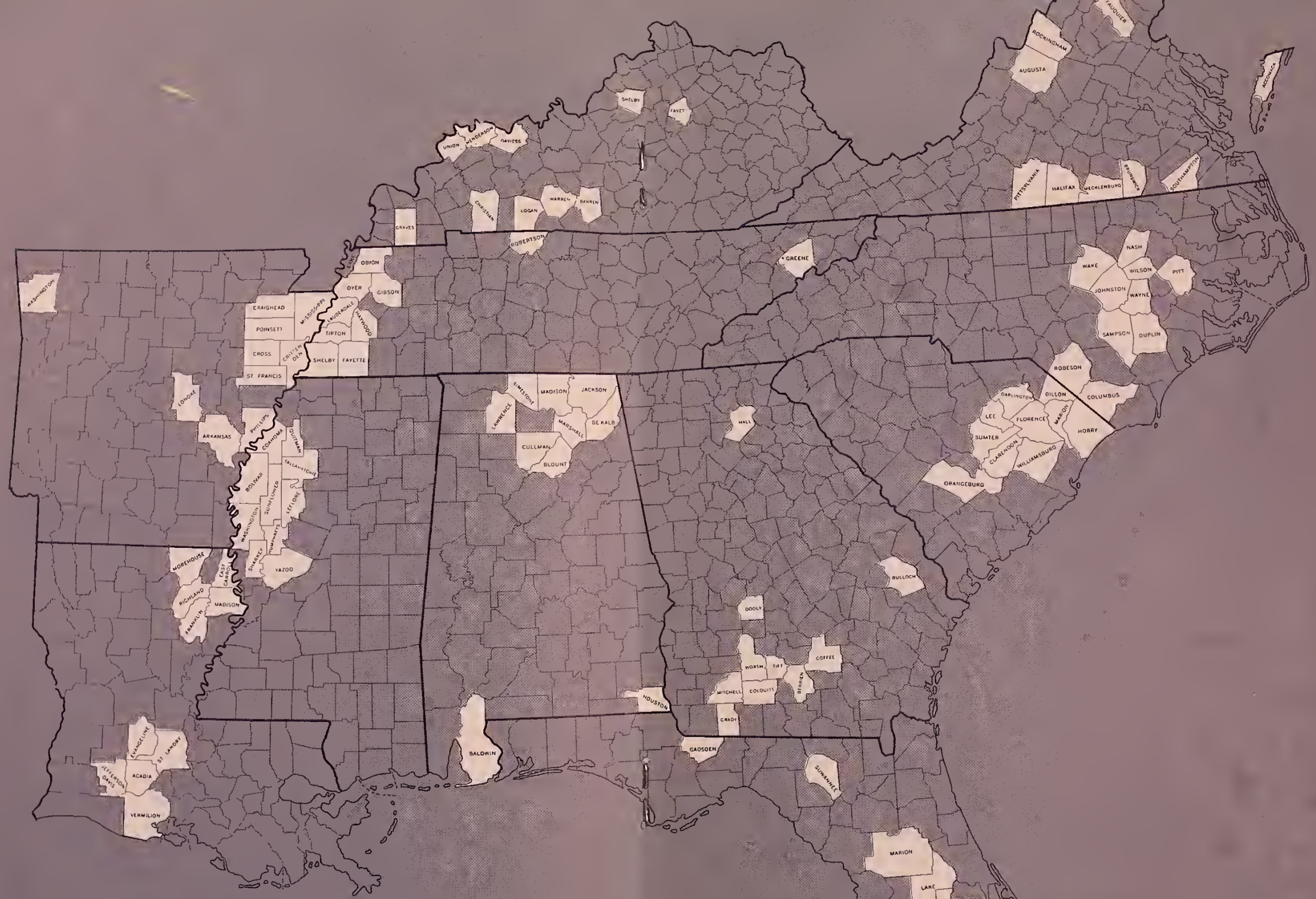

FIG. 2 TEN COUNTIES IN EACH STATE WITH HIGHEST PETROLEUM EXPENDITURES FOR FARM PRODUCTION, 1969

Table 9—Number and percent of farms in the South using LP gas, 1970

State	Number of farms		Percent of farms using LP gas
	In State	Using LP gas	
	1,000		*Percent*
Virginia	72	14	19
N. Carolina	158	46	29
S. Carolina	52	18	35
Georgia	77	47	61
Florida	34	19	56
Kentucky	123	43	35
Tennessee	127	29	23
Alabama	86	46	53
Mississippi	95	70	74
Arkansas	74	53	72
Louisiana	53	32	60
Total	951	417	44

[1] *Agricultural Prices, Dec. 1970; and Number of Farms, Jan. 1971, Crop Rptg. Board Statis. Rptg. Serv. U.S. Dept. Agr.*

needed? How much capital is required? What is a minimum volume operation—to break even and to show modest net savings? What are the possible benefits for farmers? The following sections of the report consider the economic aspects of liquid petroleum and LP gas operations.

Liquid Petroleum Operations

Liquid petroleum operations are the most common type and include bulk distribution of such refined fuels as gasoline, diesel fuel, fuel oil, and kerosene. Firms distributing these products also sell lubricating oil and grease. Tires, batteries, and automotive accessories usually are included in a retail petroleum operation.

Facilities of a liquid petroleum distribution operation are tied to the typical products distributed. The bulk petroleum operation includes bulk storage tanks and tank trucks to make delivery to farmers, along with necessary pumps and hoses. Generally, a distributor selling or providing farm tanks lets local practices determine lease or use arrangements. Other facilities, such as service and office equipment, storage space for merchandise and trucks, service station building and equipment, or retail pumps are additional items requiring capital outlays.

Capital Needs

Requirements for capital vary with variety of services provided and the levels of volume. Working capital, particularly for inventory and credit, is an important item.

A recent study from Louisiana State University reports on capital outlays for three levels of operations handling a variety of petroleum products except LP gas. The capital figures in table 10, based on that study, represent both fixed and operating needs.

Table 10–Capital requirements by size of operation, 1968[1]

Size	Volume		Capital[2]
	Gallons	Dollars	Dollars
	1,000		
Small	250	75	22
Medium	700	200	55
Large	2,000	600	130

[1] *Wiggins, P.L., and Roy, E.P. Economic Feasibility of Wholesale and Retail Outlets for Supplying Louisiana Farmers. Econ. Res. Rept. 385, Louisiana State University, Baton Rouge Nov. 1968.*

[2] *Study figures adjusted upward to include capital for providing on-farm storage tanks.*

Size of bulk petroleum operations may be measured both by volume of gallons and dollars. Gallon volume provides comparisons on storage size, trucking facilities, and efficiences of labor and equipment in distribution. Distributors also use a gallons measurement to determine tank-truck requirements and performances. Dollar sales as a measure of size is useful when discussing capital performance, margins, expense, and return on capital.

When product mix and selling prices are somewhat uniform, a close relationship exists between volume of gallons and dollars. For instance, the dollar volume for 3-gallon categories is uniformly less than a third of the gallon figures.

Capital requirements decrease as volume increases, reflecting an economy of scale. For instance, the capital-to-sales ratio was about $1 of capital to $3.50 of sales for the first two size-categories. For the 2 million gallon volume, sales were about $4.50 for each dollar of capital.

However, the emphasis in this report is not to stress economies of scale with regard to capital, but to indicate probable capital needs for varying sized operations.

Margins and Expenses

Size of operation has a direct bearing on the amount of net margin, as table 11 data indicates.[3] Gross margins, as a percentage of sales, are slightly lower for

[3] *Margin and expense figures in table 11 were developed from Louisiana State University research previously mentioned and from a study by Kansas State University: Manuel, Milton L., and Shuyler, Kent D. An Economic Analysis of Distributing Bulk Petroleum Products to Farms. Agr. Expt. Sta. Res. Paper 5, Manhattan, Kan. June 1971.*

Table 11–Relation of margins and expenses to size of operation

Item	Size of operation (1,000 dol)		
	75	200	600
Gross margins (pct. of sales)	15.2	15.8	15.8
Expenses (pct. of sales)	14.0	13.3	12.3
Net margins (pct. of sales)	1.2	2.5	3.5

smaller operations. Expenses, as a percentage of sales, decline as the volume increases. This combination results in increased net margins as total volume grows.

Return on Capital

Net margin dollars for the high-volume category represented a return to capital of 16.1 percent, about four times the 4.1 percent return on capital for the low-volume group. This higher return reflected the combination of lower capital requirements and lower expense percentage in the high-volume group.

Distribution Performance

The Kansas State research report divided 21 operations into large and small sized operations, with $150,000 as the dividing sales volume (table 12).

Size of operation had a direct relationship on the amount of net margins. Large operations with 819,434 gallons in volume had a net margin of $11,851.

Table 12–Comparison of cooperative bulk petroleum operations, by size, Kansas, 1966

Comparative factor	Size		
	Average	Large	Small
Number of operations	25	12	13
Volume–dollars	138,972	206,467	76,668
Volume–gallons	560,322	819,434	321,141
Gross margin–dollars	21,402	32,622	10,964
Gross margin–pct. of sales			
Gasoline	13.4	13.8	12.4
Diesel & fuel oil	23.2	23.0	23.8
Oil & grease	18.9	19.9	15.8
All products	15.4	15.8	14.3
Total expenses–dollars[1]	14,926	20,771	9,530
Pct. of sales	10.7	10.1	12.4
Net margin–dollars	6,476	11,851	1,434
Pct. of sales	4.7	5.7	1.9
cents/gal	1.17	1.45	0.45

[1] *Includes computed delivery expenses increased by 15 percent to cover estimated administrative and inventory costs.*

Small operations with 321,141 gallons in volume had a net margin of $1,434. Total expenses, however, as a percentage of sales, were only slightly larger for the small operations than for the large ones, 12.4 percent for the small, and 10.1 percent for the large. Diesel fuel and fuel oil had the highest gross margin in both groups as compared with gasoline and oil and grease.

Direct expenses, exclusive of administrative and inventory costs, averaged $12,372 in all associations and were allocated by item as follows:

Expenses	Dollars	Percent of total expenses
Bulk plant	731	5.9
Delivery		
Driver pay	8,416	68.0
Gas, oil, tires, repairs	1,526	12.4
Truck depreciation	1,090	8.8
Other truck expenses	609	4.9
Total delivery	11,641	94.1
Total	12,372	100.0

Some operating performance items that pertain particularly to the delivery operation are listed in table 13.

Miles driven and gallons delivered per truck are basic factors in cost control. Mileage per truck was 11,200 miles in the low-volume associations compared with 18,320 for trucks in the high-volume group. Thus, the trucks in the high-volume group had better than 50 percent more mileage per truck. Gallons delivered per truck-mile were 21.5 in the low-volume group compared with 17.7 gallons in the high-volume group.

Gallons delivered per truck vary according to season and type of farming, geographic concentration of patrons, extent of fuel used for winter heating,

Table 13–Performance of bulk trucks by volume, Kansas, 1966

Comparative factor	Size		
	Average	Large	Small
Total delivery cost– cents/mile	41.5	37.6	52.9
Truck expense–			
cents/mile	12.5	11.7	14.7
cents/gallon	0.68	0.681	0.678
Bulk plant expense cents/gal. sold	0.13	0.11	0.16
Miles driven/truck	15,932	18,320	11,200
Gallons delivered/truck mile	18.7	17.7	21.5
Gallons delivered/truck	297,928	324,264	240,800

truck routing and "keep-full" systems, and the extent delivery capacity is in line with demand.

Delivery costs can be reduced by (1) Using proper-sized delivery equipment; (2) efficiently locating bulk plants; (3) using two-way radios; and (4) improving delivery routing.

Liquefied Petroleum Gas Operations

Increasing use of LP gas by farmers in the United States for production and home use (four-fold from 1949 to 1966) merits the attention of cooperatives. Volume of LP gas distributed by cooperatives in the United States increased from 12 billion gallons in 1949 to 579 billion gallons in 1968. Cooperatives' share of U.S. farm consumption increased from more than 2 percent in 1949 to 21 percent in 1968.

Cooperatives' share of the LP gas market in the South is lower than for the entire United States. However, the farm market for LP gas in the South increased about seven times from 1949 to 1968. The estimated market in 1970 was more than 800 million gallons.

Next to gasoline, LP gas had the greatest use by farmers in 1968. It represented about 25 percent of total petroleum used, more than the combined use of diesel fuel and fuel oil. With LP gas amounting to more than one-fifth of all petroleum used by farmers and with saving from 2 to 3 cents per gallon, efficient distribution by cooperatives could prove a real benefit for farmers.

Prices paid for LP gas by farmers in the South Atlantic Region in mid-1970 averaged 18.5 cents per gallon. The average U.S. price paid by farmers was 14.7 cents per gallon.[4]

In the South Atlantic Region, South Carolina farmers paid the highest price—19.5 cents per gallon. Georgia farmers reported paying 18.8 cents and North Carolina farmers paid the lowest price—18 cents per gallon.

The average cost of LP gas to distributors in the South Atlantic Region in mid-1970 likely did not exceed 8 cents per gallon. This meant a gross margin of 10.5 cents per gallon, or nearly 60 percent. With such a margin, an efficient distributor with adequate volume should realize a good net margin.

Facilities needed to distribute LP gas vary mostly by size of operation. Facilities include bulk storage tanks, tank trucks, service trucks, and farm and home tanks. As with liquid petroleum operations, other facilities include office space, office and service equipment, and storage space for merchandise and trucks.

Financial Information

For LP gas, there is about a dollar of capital for each dollar of sales compared with $3 to $4 of bulk petroleum sales per dollar of capital. The higher capital needs for LP gas are due mostly to the expensive pressurized containers, for both storage and delivery.

---

[4] *Agricultural Prices; Crop Rptg. Board, Statis. Rptg. Serv. U.S. Dept. of Agr., Dec. 1970.*

Table 14—Comparison of capital requirements for distributing LP gas and liquid petroleum in relation to sales, southeastern U.S., 1968

Comparative factor	Size of operation (1,000 gallons)	
	660[1]	1,750[2]
Sales volume—1,000 dol.	179	394
Capital required—1,000 dol.	170	334
Gross margins—pct. of sales	55	55
Expenses—pct. of sales	44	45
Net operating margins—pct. of sales	11	10
Return on capital—pct.	11.8	12.0

[1] *Cost of Doing Business Survey. National LP Gas Association, (20 comparisons). Chicago, Ill.*

[2] *Ibid (31 comparisons).*

The relationships for the factors shown indicate only slight differences by size. In the low-volume group, sales were $1.05 for each dollar of capital compared with $1.18 of sales in the high-volume group.

Appendix table 2 presents data on three LP gas operations, all with comparable volume. These data are by gallon, and reflect differences between areas for selling prices and gross margins.

Distribution Operations

Because size of operation has little effect on economy, internal efficiencies must be considered to minimize costs.

Appendix table 3 details distribution data for LP gas trucks. As with distribution of liquid petroleum products, effective use of trucks and labor is the key to efficient operations. For instance, the hours of truck use per month ranged from 79 to 337 hours and averaged 192 hours. Gallons delivered a month ranged from 25,000 to 150,000 with 80,000 gallons as the average. Gallons delivered per mile averaged 19, but for the 45 trucks, the range was from about 11 to 36 gallons per mile.

Better-than-average performance should result in lower costs. The averages, adjusted for geographic, seasonal, and other operational differences, may be used as guides to appraise distribution performance.

Potential Benefits

Preceding data indicate petroleum distribution operations could provide a range of net margins of 1 to 4 cents per dollar of sales, up to 2 cents per gallon.

A 25-percent share of the petroleum market in the South would about quadruple the present $35 million petroleum volume of cooperatives and amount to about $140 million. An additional $100 million in petroleum sales could save farmers $1 million to $4 million a year. This opportunity is not a one-shot situation, but continues each year. Under stated conditions the total savings could amount to between $10 million and $40 million in 10 years.

The total potential for savings is even greater, because most cooperatives that add petroleum products to existing services boost volume for other items, especially tires, batteries, and accessories. For example, a cooperative in Tennessee that added bulk petroleum in 1970 reported a 100-percent increase in automotive accessory sales and a 30-percent increase in oil sales the next year. Additional volume for a cooperative may also add to total net margins by lowering costs through better use of labor and facilities and spreading fixed expenses.

ATTITUDES AND PROBLEMS

The market potential and economic considerations clearly justify cooperatives expanding petroleum distribution efforts in the South. What can be done to encourage cooperative acceptance of this existing opportunity?

One place to begin is recognizing attitudes and problems that presently limit distribution efforts. Attitudes, currently noted in interviews with petroleum personnel in regional and local cooperatives, were:

1. Farmers seem to be getting good service from the existing distribution system.
2. Competition is firmly established and market entry would be difficult.
3. Benefits to farmers would be probably greater in distribution of other supplies.
4. Present capital is fully employed and additional funds would be difficult to raise.
5. Distributing petroleum has never been a function of the association.
6. Handling petroleum would be another problem and our regional has plenty of problems with present operations.

Problems included the following:

1. Availability of petroleum products to regionals from cooperative refineries seemed to be limited.
2. Personnel at local cooperatives complained about lack of support from regionals in the form of leadership, expertise, and capital available in petroleum distribution.
3. Locals didn't have enough petroleum volume to warrant effective buying at the wholesale level.

Are these attitudes legitimate and are the problems real? If farmers benefit from cooperative distribution, attitudes of those in policy positions will need to be considered and problems solved.

The attitudes of the majority reflects an acceptance of the status quo. It suggests a lack of enthusiasm for extending to farmers the full benefits of cooperative effort by adding new services, especially petroleum services.

Each regional or local association should provide its own responses to change attitudes and solve problems. The responses should be considered with the view to improving farm income through lower farm costs.

As mentioned previously, expenditures for petroleum are an important element in farm costs. They constitute about 12 percent of cash outlay for

operating supplies and equipment. Cooperatives have amply demonstrated that petroleum distribution fits well in an integrated farm supply operation. This enables a cooperative to more fully serve farmers and lower their production costs.

Thus, managers and directors of cooperatives in the South are challenged to begin or expand petroleum supply services to members.

OBSERVATIONS AND RECOMMENDATIONS

Before entering petroleum distribution, consider: Market potential, competition, market entry alternatives, and operating suggestions.

Market Potential

Market potential includes both users and products. Users may be rural, suburban, or urban. Rural users would include farmers and non-farmers. Farmers would buy for production, as well as for non-production purposes, such as household uses and personal use of automobiles and trucks. As indicated previously, about a fourth of farmer purchases of petroleum products in 1968 was used for other than farm production.

For rural non-farmers and suburban or urban dwellers, the principal use would be for household consumption, such as home-heating, cooking, and water heating. However, many rural non-farmers have small tractors and pick-up trucks that would add to their petroleum needs.

Products, used by farmers in production, would be gasoline and diesel for motor fuels and fuel oil and LP gas for curing and drying crops and for heating farm buildings for broiler and hog production.

USDA figures show average tractor use to be about 700 gallons and truck use 375 gallons per year. For drying crops, a 1966 study showed corn used an average of 1 gallon of fuel for each 5 bushels of corn dried. For peanuts, a gallon of fuel dried about 45 pounds. Curing tobacco used 1 gallon of fuel for each 5.6 pounds cured.

Heat for broiler houses is an important use of LP gas. University of North Carolina data show that about 1 gallon of gas is used to produce 20 birds. Other uses of fuel are for heating layer, turkey, and pig brooders. Stationary engines, such as those used as irrigation pumps, are increasing in number and increasing demands for fuel.

Non-farm use would include gasoline as a motor fuel, but fuel oil and LP gas for domestic use would be much more important. Domestic use of these products could amount to 1,000 gallons for home heating and 300 gallons for cooking and heating water at each point of use. Geographic location, as a winter heating factor, is the principal element in home-heating requirements.

Trends in product use are an important consideration. For instance, the use of LP gas on U.S. farms has increased from 1.3 billion gallons in 1959 to 2.4 billion gallons in 1969, an increase of 85 percent. During that same period, gasoline use by farmers dropped from 5.6 billion gallons to 5.2 billion gallons. In viewing market potential, LP gas merits attention, because of its continuing high rate of increase in consumption. Gasoline is important, because of its

magnitude—more than double the volume of LP gas, its nearest fuel competitor.

Use patterns vary by region and type of farming, making market potential appraisal a local concern related to the prospective service area.

Competition

When market size is determined, an appraisal of competition is necessary. Factors to consider are number of distributors, relative size, extent of specialization, length of time in service area, and distribution practices.

Each of the above will influence the extent of market penetration by a new competitor. However, a cooperative or group of farmers may have some built-in offsets. The matter of volume and possible share of the market can be projected on the basis of the number of signed-up or participating members or patrons. Patron images of existing cooperatives in an area will help determine support for another cooperative venture.

Another factor to consider, along with competition, is the trend of gross margins in petroleum distribution at the retail level.

The 1970 Factbook Issue of *National Petroleum News* reported that gross margin at service stations (average mark-up above dealer tank-truck price) was 33, 31, and 39 percent, respectively for the years 1950, 1960, and 1969. Thus, the 1969 margin was the highest of the selected years, although the expense ratio probably increased too. Such a margin suggests the potential for savings under conditions of adequate volume and efficient operations.

Where gross margins are relatively low, some cooperatives, such as those in Virginia and Maryland, have been able to improve delivery service especially to small- and medium-sized farms and make modest savings. Establishing routes and lending farm storage permitted deliveries every 2 weeks and provided service to all types and sizes of farm operators efficiently.

Market Entry Alternatives

A cooperative may have several alternative methods for beginning a petroleum distribution operation: Buy an existing distributor; build new facilities; jointly distribute petroleum products with another cooperative, either with used or new plant and equipment; arrange for tank trucks to obtain fuel from bulk plants of a major area supplier; and bargain and contract with a supplier to supply products for members at specified prices and terms.

Purchasing an ongoing service offers many advantages: (1) Permits a start with a somewhat assured volume, particularly if delivery personnel can be retained; (2) eliminates losses associated with high costs and low volume during a build-up period for a new operation; (3) permits possible purchase of facilities and equipment at depreciated values; (4) provides an opportunity to purchase on contract, permitting payments to be made over time from operating margins, thus reducing an otherwise sizable initial capital outlay; and (5) minimizes disruption in the market by maintaining the number of distributors rather than adding another.

Possible disadvantages are: (1) Chance of buying old and perhaps obsolete equipment; (2) overvaluating accounts receivable; and (3) overestimating the value of a distributorship as related to goodwill or business name.

To overcome the problems of building volume and attendant high-unit costs, some local supply cooperatives work together to provide a petroleum service. Three Tennessee cooperatives, each serving a county, organized a petroleum cooperative and located it to serve patrons in all three counties. This permitted a sufficiently high initial volume to distribute fuel economically.

A cooperative starting a petroleum distribution service for a limited area with a moderate assurance of patronage takes about 3 years to develop enough volume to get net margins. When such a new service is added to an already established, successful supply cooperative, the time could be less because of cost-sharing practices and established patronage.

Arranging for cooperative tank trucks to obtain fuels from bulk plants of a major company, such as in Washington State, would greatly reduce capital requirements for market entry. Using such a plan probably would be available only to a strong cooperative serving a large area.

Bargaining and contracting with suppliers for products at specified prices and terms has been used effectively in some areas, such as California, but has no assurance of permanency.

Operating Suggestions

Capital, facility, and volume relationships have been mentioned previously. Because of cost-sharing, an operation that begins as a part of an existing cooperative could operate economically on lower volume than an entirely separate business. Some shared costs are management, accounting, office space, and even some delivery labor. Cooperatives, with both petroleum and fertilizer services, may utilize delivery labor during the peak season of one product and the slack season of another. In the case of LP gas, tanks can be interchanged with anhydrous ammonia tanks to fully utilize equipment. However, such exchanges require special cleaning.

Current credit and patron tank policies necessitate high capital requirements. The amount of capital for credit will vary with each cooperative's management and board policies in each area. The practices connected with furnishing customer tanks becomes standardized in trade areas and capital required for them is less affected by management.

Tank programs, varying by area but generally standardized locally, may include a complete line of supplies from the distributor. Some plans provide for a lifetime lease for a $50 fee or a rental arrangement based on time or volume. Another variant is the minimum volume to obtain a tank hook-up.

An LP gas truck with a 2,500-gallon capacity could distribute from 80,000 to 100,000 gallons in about 190 hours each month within a 40-mile radius. These figures for LP gas are based on 45 truck records of a regional cooperative for January 1969. Distance and time variations would affect the number of gallons accordingly.

Distribution of liquid petroleum per truck would be less, because tank capacity is less, often not more than 2,000 gallons.

In some areas, where cooperative distribution of petroleum is comparatively low, some may feel it's too difficult at this time to try for a larger market share.

The principal result of such an attitude is to preclude farmers from receiving the services and savings possible from an expanded cooperative distribution.

Personnel of regional cooperatives suggest that market penetration, under proper timing, is no more difficult today than in the past. One regional began 12 years ago to distribute petroleum—a late starter by the standard of many other regionals—now has about 14 percent of its State market and is still adding petroleum outlets.

An indication that farmer cooperatives in the South can add to their petroleum distribution operations is the record of 21 associations of a regional cooperative in the South. A 4-year record operation—1967-71—showed the following for 21 retail petroleum operations:

1. Volume went from $11.2 million to $14.6 million, an increase of 30 percent.

2. Total gallons rose from 50.2 million in 1967 to 61.2 million in 1970, up by 22 percent. Fuel oil, the largest volume item, was up from 19.6 million to 23.6 million gallons, an increase of 21 percent.

3. Gross margins went from 20 to 23 percent.

Expenses also increased, but net margins held at about 6.5 percent of sales, at a rate of 1.5 cents per gallon.

Another regional reported an 18 percent increase in unit volume of petroleum from 1969 to 1970. LP gas sales by the regional were up 40 percent during the year.

The experiences of these two regionals demonstrate the potential for increased distribution of petroleum by cooperatives.

In many areas where supply, marketing, and service cooperatives presently serve farmers but distribute little or no petroleum, the opportunity for such service should be recognized and seriously considered.

APPENDIX

Appendix table 1—Production petroleum expenditures of farmers in 10 counties with highest expenditures in the South, 1964

State & county	Expenditure	State & county	Expenditure	State & county	Expenditure
	$1,000 dol.		*1,000 dol*		*1,000 dol*
Alabama		**Kentucky**		**South Carolina**	
De Kalb	1,248	Christian	903	Horry	2,722
Cullman	1,108	Daviess	852	Florence	2,180
Baldwin	1,092	Barren	751	Williamsburg	1,557
Madison	1,024	Logan	739	Orangeburg	1,408
Limestone	846	Henderson	721	Darlington	1,241
Houston	773	Fayette	692	Dillon	1,137
Marshall	757	Union	691	Clarendon	1,078
Jackson	686	Shelby	664	Sumter	1,007
Lawrence	680	Warren	664	Marion	903
Blount	612	Graves	662	Lee	731
Total	8,826	Total	7,339	Total	13,964
Arkansas		**Louisiana**		**Tennessee**	
Mississippi	2,924	Vermilion	1,912	Gibson	1,166
Arkansas	2,327	Acadia	1,513	Dyer	1,048
Lonoke	2,125	Jefferson Davis	1,477	Haywood	901
Poinsett	2,074	St. Landry	1,405	Lauderdale	886
Craighead	1,337	Franklin	1,241	Shelby	884
Crittenden	1,653	East Carroll	1,062	Obion	874
Phillips	1,611	Morehouse	1,045	Fayette	854
Cross	1,545	Richland	987	Tipton	849
St. Francis	1,521	Evangeline	953	Robertson	788
Washington	1,513	Madison	855	Greene	785
Total	19,130	Total	12,450	Total	9,035
Florida		**Mississippi**		**Virginia**	
Palm Beach	2,997	Sunflower	2,529	Pittsylvania	1,684
Polk	2,264	Bolivar	2,523	Halifax	1,182
Orange	1,640	Washington	2,007	Rockingham	935
Lake	1,573	Coahoma	1,636	Mecklenburg	918
Hillsborough	1,281	Tallahatchie	1,530	Southampton	777
Dade	1,121	Leflore	1,527	Augusta	654
Hendry	1,075	Yazoo	1,252	Accomack	636
Gadsden	816	Humphreys	1,240	Loudoun	547
Suwannee	779	Quitman	1,175	Fauquier	522
Marion	734	Sharkey	926	Brunswick	522
Total	14,280	Total	16,345	Total	8,377
Georgia		**North Carolina**			
Colquitt	1,230	Johnston	2,935		
Coffee	981	Pitt	2,904		
Bulloch	956	Robeson	2,773		
Mitchell	788	Duplin	2,504		
Worth	784	Columbus	2,414		
Tift	731	Sampson	2,413		
Hall	695	Wayne	2,011		
Berrien	688	Wake	1,943		
Grady	679	Nash	1,887		
Dooly	673	Wilson	1,787		
Total	8,205	Total	23,571		

Appendix table 2—Selected data on LP gas deliveries per truck for 45 trucks of local cooperatives in North Central States for month of Jan. 1959, and estimates for Northern Florida[1]

Item	North Central States		Florida area (estimates)
	Range	Average	
Miles per trip	56-180	112	60
Gallons delivered per hour	294-651	413	600
Total hours of truck use per month	79-337	192	200
Gallons delivered per month	25,000-150,000	80,000	120,000
Gallons delivered per mile	10.8-35.8	19	33
Gallons per trip	Not indicated	2,083	2,000
Miles traveled per month	1,545-7,143	4,217	3,600
Number of trips per month	14-60	38.4	60

[1] *Bailey, John M. Feasibility of LP Gas Cooperatives in Northern Florida. Serv. Rept. 110, Farmer Cooperative Serv. U.S. Dept. Agr. March 1970.*

FARMER COOPERATIVE SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Farmer Cooperative Service provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The Service (1) helps farmers and other rural residents obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs.

The Service publishes research and educational materials and issues *News for Farmer Cooperatives*. All programs and activities are conducted on a nondiscriminatory basis, without regard to race, creed, color, sex, or national origin.